

PROGRAMME DESIGN THAT PUTS THE ‘ME’ BACK INTO LEARNING EXPERIENCES AND SPACES

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ABSTRACT

A key objective of tertiary education is to foster fundamental shifts in learners’ understanding of what learning and thinking comprises, and the role they perform. Learning theorists stress the requirement that students are involved in process-based, experiential activities. The design of curricula and courses must therefore encourage engagement with tasks, peers, teachers and the community.

This paper outlines a forty-week Computer, Research Skills and Projects (CRSP) course developed for Foundation students at Dubai Men’s College (DMC) using a blended learning approach underpinned by socio-cultural principles and an Activity Theory (AT) framework, and reports briefly on the associated research study.

INTRODUCTION

A key objective of tertiary education is to foster fundamental shifts in learners’ understanding of what learning and thinking comprises, and the impact that has on their role as well as that of the teacher (Harrison, 2007). Ramsden (1992) claims that many students learn to imitate the disciplines they are studying, which includes memorising unrelated facts, remembering ‘right’ answers, and focussing on skills that enable them to pass assessments. Learners who are unable to use higher order thinking and interpersonal skills tend to be over-dependent on teachers, and are ill equipped in authentic situations to apply discipline concepts (Milken, 2007).

Learning theorists stress that students need to be actively involved in process-based, experiential activities, which encourage them to internalise, reflect on, and externalise concepts. Therefore, active learning focuses less on task completion and formal assessment, and more on equipping students with the ability to interpret and apply acquired learning in real-life contexts. It is of benefit therefore, if the design of curricula

and courses encourages students to engage actively with tasks, peers, teachers and the community through computer-mediated communication, as well as in face-to-face situations.

This paper describes a forty-week Computer, Research Skills and Projects (CRSP) course that was developed at Dubai Men's College (DMC) for students entering their Foundation (freshman) year. A blended¹ approach was adopted using socio-cultural principles as a theoretical underpinning and Activity Theory (AT) as a framework to help tailor the course for Emirati learners. Practical application of the theory is illustrated, and a brief report is given on the associated research study.

THEORETICAL FRAMEWORK

Socio-cultural theory has its foundations in the work of Vygotsky (1986), and later developed by theoreticians such as Wertsch (1998) and Engeström (1996). Its central hypothesis is that human development, in particular higher order functions, arises from the social interactions of an individual with the external world which includes people, objects, and events (Tharp, & Gallimore, 1988). Participation in a social setting has the potential to enhance learning through, for example, assistance from and collaboration with more advanced peers or a teacher (a concept known as 'scaffolding'). Thus, opportunities can be provided where the gap can be bridged between a learner's already assimilated knowledge or skills, and knowledge or skills yet to be assimilated (Wertsch, 1998).

Engeström developed from socio-cultural theory an expanded notion of cultural-historical AT that is applicable for analysing tool-mediated learning systems (Naismith, et al, 2004) and interpreting human interaction. AT provides a way of investigating a socio-cultural interaction (activity system) that allows significance to be placed on the space and tools (including language), along with concepts of 'rules', division of labour, internalisation, externalisation, the hierarchical structure of activity, and continuous development (see Figure 1).

¹ Blended-learning (also known as hybrid, or flexible learning), is defined in relation to the CRSP course as "learning that is facilitated by the effective combination of different modes of delivery, models of teaching and styles of learning, and grounded on transparent communications amongst all parties involved with a course" (Heinze & Proctor, 2004, p. 10).

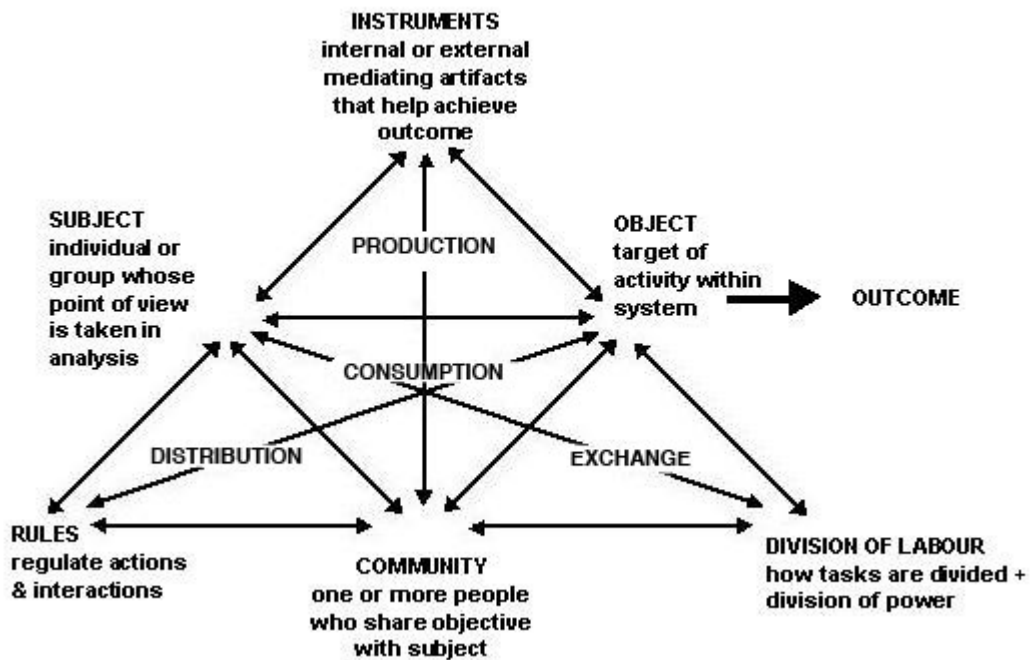


Figure 1: The system of activity – (Adapted from Engeström’s expansive activity model, 1987, p. 78)

ACTIVITY THEORY AS A FRAMEWORK FOR THE DESIGN AND DEVELOPMENT OF CRSP

Educational context: The issues

Traditionally learning was considered as the transmission of knowledge and the absorption by learners of an ultimately knowable representation of ‘reality’. Once the information had been assimilated, it was then assumed learners could apply it to authentic contexts outside of the learning environment (Cobb, 1994). However, *The Arab Human Development Report* (UN Development Programme, 2003) revealed that many Arab students “can do little but memorise, recite and perfect rote learning” (p. 54). The report also indicated that the pedagogical methodology is largely didactic, teacher-centred and passive, and assessments require the use of memorisation and regurgitation of ‘facts’.

DMC, part of the wider organisation of the Higher Colleges of Technology (HCT) in the UAE, is a tertiary, English language medium institution for Emirati males. For DMC students, the majority of whom are between the ages of seventeen and twenty years of age, it is a challenging process to adapt their approach to learning, their way of thinking, and their expectations of the teacher and themselves as learners (Peach, 1997).

Therefore, during this transition it is paramount to provide sufficient support (McGrath, & Noble, 1995).

THE COMPUTER, RESEARCH SKILLS AND PROJECTS COURSE – DESIGN FACTORS AND FEATURES

Background to the CRSP course

The Foundations programme at DMC historically comprised four stand-alone courses: Mathematics, Computing, Arabic and English (see Figure 2). Research and study skills were taught as discrete skills-focussed units (e.g. time-management) in weekly sessions administered by the Library Learning Centre. Issues with this approach included sparse communication, non-integrated ‘projects’ completed in isolation, assessment overload, and minimal recycling and reinforcement of key skills.

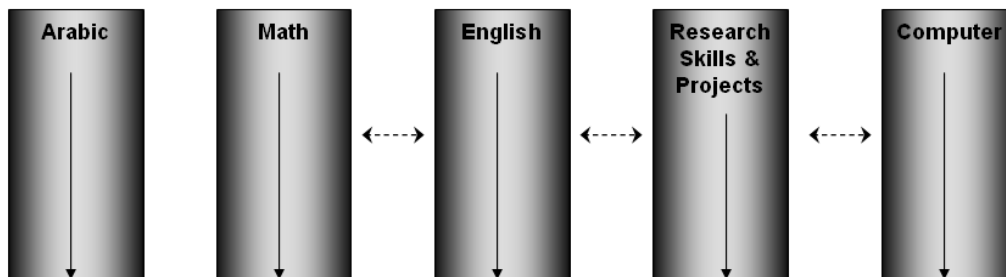


Figure 2: Foundations courses prior to their integration with CRSP (Young, 2005)

Research indicates that it is important to integrate content courses so that students are encouraged to develop multiple representations of ideas while engaging in activities that require them to apply the target concepts and skills (Krajcik, et al, 1998).

Consequently, the Foundations Faculty at DMC, using AT, designed and implemented Research Skills and Projects (RS&P - see Figure 3) that incorporated research, study and critical thinking skills in a dynamic interrelationship with the four main Foundations courses.

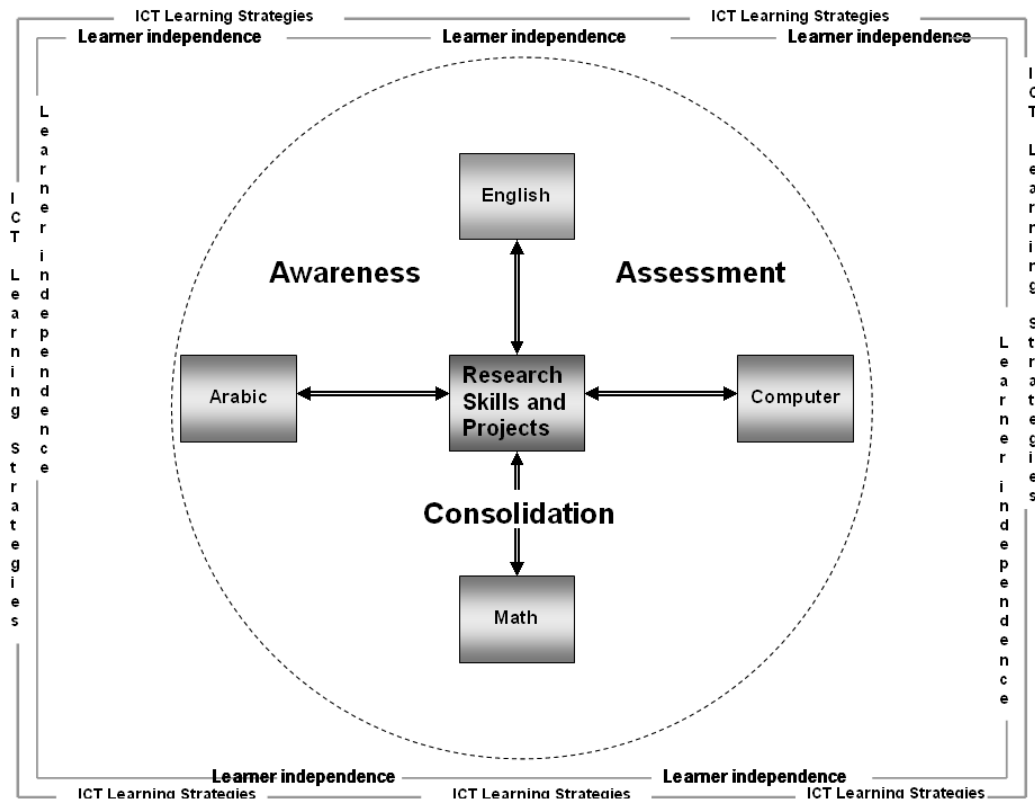


Figure 3: Interdisciplinary, integrated Foundations approach (Moran & Owen, 2007, Adapted from HCT Numeracy Process Model, UAE Ministry of Education, 2005)

This course was further developed into Computer, Research Skills and Projects (CRSP) that requires students to complete a series of assessed and non-assessed tasks set within four projects: The Country Project, The Famous Person Project, The Career Project, and The Inventions, Developments and Change Project. All projects are completed over the forty-week academic year utilising four hours per week face-to-face sessions, a one hour per week face-to-face tutorial, synchronous and asynchronous interactions with teachers and peers, and the learning management system (LMS), WebCT. Students produce one main artefact per project for which they receive feedback from each of the content instructors, as well as the CRSP instructors, and undergo self-reflection thereby ensuring that the process is cumulative, iterative and experiential.

Activity theory as a design framework

The following section provides examples from CRSP to illustrate how specific components identified by the AT framework (see Figure 4) have been integrated into the design of the course.

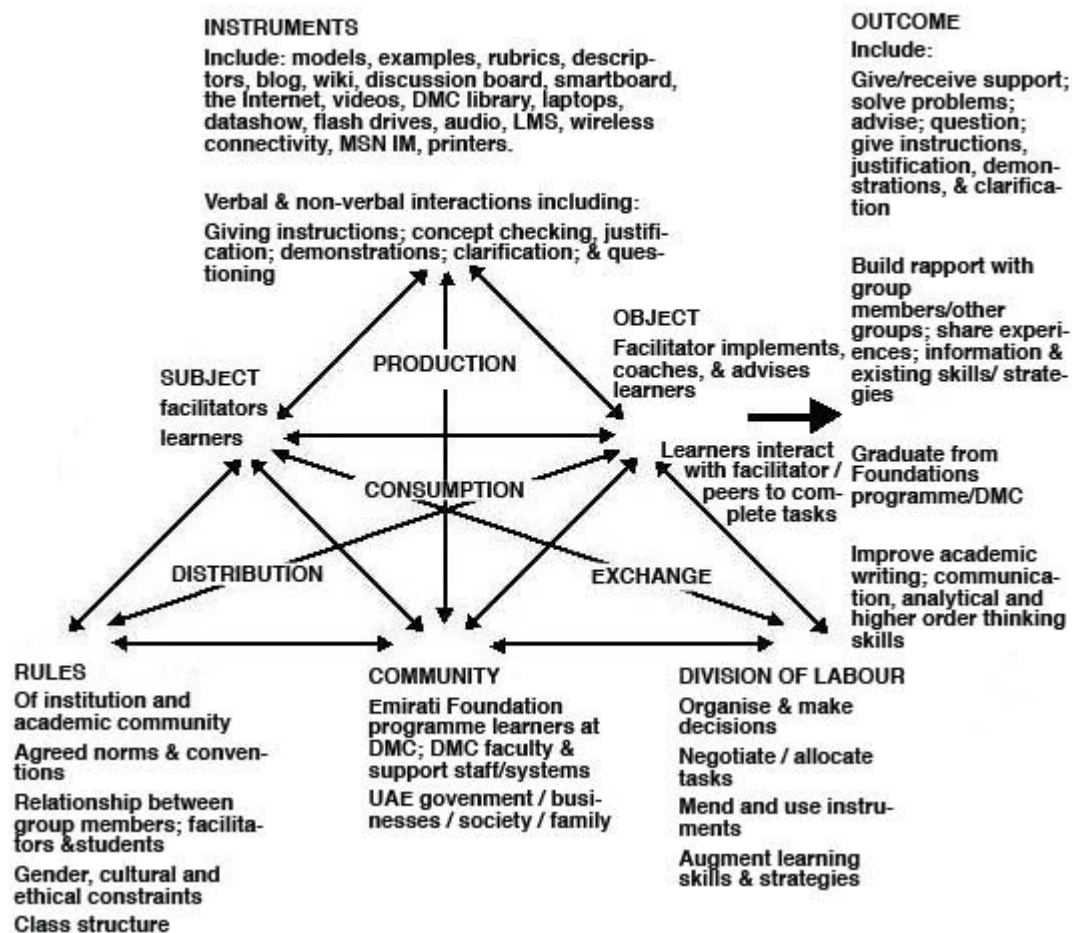


Figure 4: The CRSP system of activity analysis (Adapted from Engeström's expansive activity model, 1987, p. 78)

Cognitive tools

The projects and tasks in CRSP often require learners to use skills that they do not possess. As such, their performance of these activities is scaffolded with cognitive tools (Jonassen, & Rohrer-Murphy, 1999) (see Table 1). A variety of formats and media are employed to help meet differing student learning preferences: visual, aural, read / write, kinaesthetic, multimodal (Fleming, & Bonwell, 1998).

Strategy / Tool	Scaffolding / Enhancements provided / Outcome	Skills Acquired
MSN IM / blogs / Wikis	<ul style="list-style-type: none"> Students communicate with peers / instructors from any location with wireless connectivity 	<ul style="list-style-type: none"> Communication / interpersonal

- Encourages shy students to communicate
 - Encourages learners to refine problem / question
 - Easier for inter-gender communication
 - Saved IM history can be accessed later
 - Empowers students
 - Meets individual needs
 - Opportunities to communicate for authentic purposes, & practise range of language functions
- skills
 - Global awareness
 - Problem solving
 - Self-directed learning
 - Appropriateness of language / formality / awareness of audience
 - Life-long learning

- LMS - WebCT
- Provides searchable location for communication tools, calendar, quizzes etc, & place to submit homework / assignments
 - Enables students to consult & retrieve resources 24/7 remotely
 - Gives access to all models, examples, videos, podcasts, materials, & resources
 - Empowers students who do not have to wait for teacher to ‘reveal’ tasks / timetable
 - More advanced / motivated students can access / complete work ahead of time
 - Enables students who work / travel / are absent to keep up with course requirements
- Project management
 - Empowerment
 - Self-directed learning

- Calendar (in LMS)
- Gives students overview of course
 - Has assignment reminders
 - Gives final deadlines
 - Can be personalised
 - Provides live links from calendar directly to task, rubric, instructions, tool, or explanation
- Time / project management
 - Self-directed learning

- Late policy (applied to assignment submission)
- Provides opportunities to discuss concept of time / project management
 - Highlights importance of time management in a study / work environment
 - Demonstrates that work submitted late (without documented reason(s)) has
- Time / project management
 - Self-reflection
 - Global awareness
 - Problem solving

	<ul style="list-style-type: none"> consequences Encourages self-reflection 	<ul style="list-style-type: none"> Analytical skills
Laptops	<ul style="list-style-type: none"> Flexibility enables learners to communicate / collaborate using synchronous & asynchronous tools Assist in the collection / collation / analysis of original research data Encourage students to be organised (e.g. file naming conventions and file management) Raise global awareness (e.g. security issues such as viruses) Assist students to take responsibility for their own learning (e.g. regular backups) 	<ul style="list-style-type: none"> Data gathering Organisation Production & presentation of artefacts Communication skills
Zero tolerance for plagiarism	<ul style="list-style-type: none"> Provides opportunities to discuss the concept of plagiarism / negative effect on learning Catches students attention where a verbal or written warning may not Raises students awareness that plagiarising has consequences Encourages self-reflection 	<ul style="list-style-type: none"> Self-reflection Awareness of plagiarism / avoidance strategies
DMC Learning Centre Web site / databases	<ul style="list-style-type: none"> Provides support for carrying out on-line searches Gives access to reliable resources Provides tips on research skills and strategies Allows direct communication with librarians 	<ul style="list-style-type: none"> Research skills Awareness of reliable resources Plagiarism avoidance strategies
Peer assessment / grading / feedback	<ul style="list-style-type: none"> Fosters attention to detail Encourages multiple revisions Introduces conventions for giving constructive feedback Encourages self-reflection / awareness Reduces marking load / allows more time for face-to-face feedback Raises awareness of appropriateness 	<ul style="list-style-type: none"> Analytical skills Language skills Appropriacy /register Comparison of data Communication / interpersonal / self reflective

		skills
Blogs/ Wikis / Dreamweaver / MS software	<ul style="list-style-type: none"> • Provides students with a suite of tools to produce artefacts with real-world relevance • Enables students to present research / share ideas / receive feedback • Artefacts are assessable / revisable / transferable 	<ul style="list-style-type: none"> • Technical skills • Illustration / application of information • Self-awareness • Lifelong learning • Awareness of appropriateness, audience / purpose • Global awareness
Camtasia videos (screen capture tool)	<ul style="list-style-type: none"> • Breaks down tasks / represents them step-by-step • Provides for range of learning preferences • Encourages consistency of approach • Empowers learners • Meets individual needs • Fosters reinforcement / revision • Allows complex processes to be presented in medium that allows students to watch / read callouts / listen multiple times - 24/7 access 	<ul style="list-style-type: none"> • Problem solving • Self-directed learning • Time management • Autonomy

Table 1: Cognitive tools provided in CRSP to scaffold learners (Owen, & Godfrey 2007, adapted from Krajcik, et al, 1998)

Conversation and collaboration tools

The activity settings (the environs of Dubai and Academic City, and the LMS, blog, IM and discussion board space) were used for collaborative group interactions, whole class interactions, and social discussions, as well as finding and evaluating resources, using the suite of online tools, brainstorming, planning meetings, and for constructing “socially shared knowledge” (Jonassen, & Rohrer-Murphy, 1999, p. 70).

Examples and models

Learners who are graduating directly from high school are unlikely to have wide world experience. Therefore they require models of how the world functions which can be used as a foundation for their own understanding (Jonassen, & Rohrer-Murphy, 1999). Models used in CRSP are clear, usually offered in a variety of media, and are well-staged to provide students with a clear idea of the type of artifact required to fulfil the learning outcomes. For example, in semester one, students are provided with, for their first formal presentation, a model that illustrates the key concepts and the phases of a formal presentation which is analysed, practised, and discussed in face-to-face and online environments. Furthermore, a model PowerPoint is uploaded to WebCT for students to access, and it clearly demonstrates 'best practise' for PowerPoint slides. As a result, students become secure in the knowledge that they are meeting the requirements of the assessment, thereby allowing them to concentrate on issues such as gaining the skills and confidence to speak in public, often for the first time.

Assessment

Ramsden (1992) argues that assessment is about measuring student learning and diagnosing specific misunderstandings in order to help students to learn more effectively. Thus, the CRSP course, rather than relying purely on standardised tests which focus on skills in isolation, uses "alternative assessments that have some value beyond the classroom" (Krajcik, et al, 1998, p. 285).

The main underpinning ethos of assessments in CRSP is to provide students with the opportunity to practise and recycle. Therefore, there is minimal weighting of assessment grades in semester one meaning that students have a chance to use the skills and strategies acquired, evaluate, and then re-use them without the possibility of failing the course in the early stages.

Learning spaces and activities

Learning spaces included in the design of the CRSP course include physical ones (such as classrooms, the library, and community spaces), and virtual ones (in particular WebCT and a suite of Web 2.0 tools²). WebCT was used as a repository to give learners free

² Web 2.0 is a somewhat controversial 'catch-all' term that is sometimes used to describe Web

access to a ‘one stop shop’ of learning objects, support tools, models, and examples.

Theory in practice

What follows is a description of the CRSP Career Project which exemplifies Jonassen and Rohrer-Murphy’s (1999) advice that activities need to be designed that are interesting, authentic, relevant, and engaging, and are based around a “project to conduct...[that has emerged] from real world contexts” (p. 69). Tasks are cumulative and are completed at regular intervals throughout ten weeks.

Task 1 – Vocabulary: Initially key vocabulary relevant to careers is introduced and students use online dictionaries to collate a record in English and Arabic. A set of associated activities are provided including tactile tasks such as flash cards and board games.

Task 2 – Podcast and analysis Task: This task helps learners select the specialisation they are going to study after graduation from Foundations. Saaty (1996) advises that mathematics should be applied to decision making, whereby a problem is dissected into its constituent parts and then is established by ranking. DMC Foundations students are not ready to undertake a quantitative process of multi-criteria decision making, so a scaffolded approach is adopted (Moran & Owen, 2007).

Initially students are helped to identify and prioritise components by listening to a podcast linked to an analysis task in WebCT. The podcast, entitled ‘Career Considerations’, features a recording of six DMC Foundations students who were interviewed on a Talkback radio station, Dubai Eye. After listening to the Podcast, students are required to a) identify reasons given for wanting work in specific careers; b) list and prioritise the considerations discussed for choosing a specialisation to study.

Task 3 - Using MS Excel to organise and display authentic research data: Students interview people in the workplace and gather data on employees’ occupations, skills, training and education. Data is sorted and collated in MS Excel, and is then used to

services such as blogs and wikis (Anderson, 2007). Originally the term was coined by Dale Dougherty in 2004, who attempted to encapsulate the theoretical underpinnings of the concept as opposed to a description of the technology itself (O’Reilly, 2005).

answer hypothetical questions about career decisions.

Task 4 - Interactive Web-based simulation activity: The UAE government's policy of Emiratisation is not clearly understood by students so CRSP includes several tasks which require students to investigate the policy. One example is a WebCT quiz that refers to three articles discussing the government's Emiratisation employment objectives. Students gather, analyse and perform calculations on data to determine which industries were subject to national quotas, the specific percentage quotas set, and how these matched industry practice. In addition, students research which courses at DMC led graduates to jobs in these industries. After completing the quiz (automatically graded, with feedback), students partake in group discussions about the effectiveness and shortfalls of the policy and the degree to which Emiratisation is important for them when making career decisions.

Students then simultaneously read and listen to information about course options available at DMC and related job opportunities following graduation, and using a list of key considerations for a hypothetical individual, model the decision-making process.

A career project 'fact sheet' which identifies factors fundamental to the topic is used to scaffold students' data gathering. This research is then applied in a timed essay assessment, a PowerPoint presentation and an assessed Web site (Moran, & Owen, 2007).

Task 5 – PowerPoint presentation: Students form groups of three or four and then select a topic from a list that ranges from the steps for writing CVs to a career that group members are interested in. Using their fact sheets along with strategies learned as part of career workshops and department presentations, students create a PowerPoint and prepare a formal ten-minute presentation which they give in front of their class. The rubric for the presentation includes criteria that reflect the best practices for PowerPoint design and formal presentations that were introduced in semester one. Students' ability to work as part of a team and take a leadership role is taken into consideration, as is the inclusion of research skills such as referencing.

Task 6 – Career Web site: Using Macromedia Dreamweaver and any multi-media software programs they choose, students design and build a career Web site. The Web site includes their CV and autobiography, summary and interpretation of collated data

from the interviews with working people, and either: a) a description of working in the UAE; or b) the course the student is going to study in HD; or c) the student's current job.

THE RESEARCH STUDY

Existing research performed in tertiary level institutions to measure the effectiveness of blended learning when framed by socio-cultural principles is limited, sometimes dated, and is not particularly generalisable to DMC. A study was therefore conducted in HD Foundations that aimed to investigate the effectiveness of CRSP, as well as providing data that enabled continuous improvement.

Data was collected in the 2003-2004 (189 participants), 2004-2005 (199 participants), 2005-2006 (201 participants) academic years and semester one of 2006-2007 (221 participants), using a variety of qualitative and quantitative data collection methods including interviews, focus groups, surveys, statistics from WebCT, assessments, and documents associated with the CRSP course. Study participants were HD Foundations students (males, with 72.9% being between seventeen and twenty years of age, and 33% are employed while studying), supervisors, faculty, and community members. The quantity of data is substantial and thorough reporting of the results is outside of the scope of this paper. As such, a brief discussion of key results and their implications is provided.

Research Findings and Implications

Findings correspond to those of similar research studies whereby “student achievement is at least as high, and often higher, [than] ...in traditional classrooms” (Bossert, 1988-1989, p. 225). Feedback can be divided into key categorical statements:

- 1) Students consider the integrated projects in CRSP as having real purpose.
- 2) Applying concepts and skills from content courses to authentic tasks to produce a diverse range of artefacts, coupled with integrated assessments, is motivational.
- 3) The CRSP approach is effective at fostering research, study, and critical thinking skills acquisition, which are later applied in HD.
- 4) When task completion expectations are high students are ‘challenged’ and a higher quality of work is produced.
- 5) The majority of students (93.8%) believe that the CRSP WebCT course is

presented professionally and is a good way to supply information, host tools, examples, models, and time-management assistance.

- 6) Practical and technical problems can be frustrating but these are accepted as an integral aspect to using technology.
- 7) Most students prefer to work in groups, although it depends on the task and the level of choice given to selecting members.
- 8) A minority (15.2%) of students prefer to use paper-based resources.

Overall, students are enthusiastic about CRSP, enjoying the freedom of choice, flexibility, and chance to practise a range of skills and strategies collaboratively. Attitude and motivation are central to the success of HD Foundations students, and a high level of experiential, scaffolded, learning with regular feedback can be effective.

CONCLUSION

It has been asserted that thinking skills cannot be taught because a learner's ability is shaped by genetics (Ristow, 1988). Presseisen (1986) on the other hand argues that "the most basic premise in the current thinking skills movement is the notion that students CAN learn to think better if...[education establishments] concentrate on teaching them HOW to do so" [capitalisation in the original] (p. 17). CRSP attempts to teach the "how" by fostering group work, peer and community interactions, and supporting the use of synchronous and asynchronous communication tools alongside face-to-face sessions to scaffold the four interdisciplinary projects. The role of the teacher becomes that of a facilitator and guide which some students and faculty find challenging. However, ultimately, the majority of learners adapt to the new learning culture where their research, original production, and creativity are valued. Furthermore, students develop new understandings about communication, making meaning collaboratively, and taking ownership of their learning spaces and experiences.

AT's easily adaptable flexible framework would be applicable in most educational settings. Although the study of CRSP includes issues of reliability, validity and generalisability, the findings are promising, whereby a blended learning approach appears to provide a supported shift toward self-directed learning that recognises the importance of the training and empowerment of students. Consequently, students are more likely to be effective in their course of choice as well as acquiring skills that will help them to be successful in their life after graduation. Further studies are, nevertheless, required before dependable recommendations can be made about developing curricula for integrated, socio-culturally underpinned blended learning

programmes.

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